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Abstracts and bibliographic citations, including the DDC accession number, are given for 30 Research Reports, Technical Papers, Utilization Reports, and Technical Reports published by the Army Research Institute (ARI) during Fiscal Year 1976. To complete the record of research accomplished by ARI in FY 76, abstracts or descriptions are included of 8 research products (e.g., Guidebook for Developing Criterion-Referenced Tests) and of 40 intra-agency Research Problem Reviews, Research Memorandums, and Technical Reports. All items are

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Technical Report 425

ABSTRACTS OF ARI RESEARCH PUBLICATIONS, FY 1976

U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES
5001 Eisenhower Avenue, Alexandria, Virginia 22333

Office, Deputy Chief of Staff for Personnel
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Abstracts

ARI Research Reports and Technical Reports are intended for sponsors of R&D tasks and for other research and military agencies. Any findings ready for implementation at the time of publication are presented in the last part of the Brief. Upon completion of a major phase of the task, formal recommendations for official action normally are conveyed to appropriate military agencies by briefing or Disposition Form.

FOREWORD

The Army Research Institute for the Behavioral and Social Sciences (ARI) publishes a series of abstracts that summarize the research on which final or interim reports have been published during each fiscal year. The series began in 1957. This Technical Report contains the abstracts for research publications for FY 1976 and FY 7T, July 1975 through September 1976.

During this period, ARI was the Army's developing agency for behavioral and social science and a field operating agency under the Office of the Deputy Chief of Staff for Personnel. Two laboratories and nine operational field units provided a flexible research program on individual accession, training and evaluation, and equal opportunity; and on team effectiveness; unit proficiency; and systems integration. The field units particularly emphasized providing responsive solutions to operational problems.

Other ARI research has resulted over the years in instruments to aid in the selection, classification, and utilization of Army personnel; these instruments are indexed in ARI's Psychological Testing Programs in the U.S. Army as well as Department of the Army Pamphlet 310-8, Index of Army Personnel Tests and Measures, 23 December 1976.

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Technical Director

ABSTRACTS OF ARI RESEARCH PUBLICATIONS, FY 1976

CONTENTS

ABSTRACTS OF ARI RESEARCH PUBLICATIONS, FY 1976

INTRODUCTION

The present volume of abstracts, continuing the series begun in 1957, summarizes the research publications of the Army Research Institute for the Behavioral and Social Sciences (ARI) for fiscal year 1976 and 197T. Each volume of the series provides a synopsis of research efforts which reached interim or final reporting stages during the period covered. The abstracts have been written, as far as possible, to describe the principal research findings in nontechnical terms; technical language is used to communicate efficiently the details of research analysis. Indexing by author and research area provides access to individual reports and topics.

Publication Categories

ARI research publications are divided into separate, consecutively numbered categories appropriate to intended audience and function.

Research Reports describe completed research programs or projects which contribute directly to the solution of Army human factors problems in the broad areas of personnel management and enhancement of human performance, both of the individual and in the Army's manned systems. They are typically divided into two parts--a nontechnical report to management and a technical supplement. Special reports (S series) are also listed in this category.

Technical Papers present technical information on research methodology or basic psychological knowledge developed out of the work program. They are primarily of interest to technically trained research workers in the Defense Department and other government agencies.

Research Problem Reviews are special reports to military management, generally prepared in response to questions raised by operating agencies when early answers are needed. They may include presentations to military management, interim bases for changes in personnel operations, and bases for research decisions. Distribution is usually limited to operating agencies with a direct interest in the content.

Research Memorandums are informal, intra-agency reports on technical research problems. They include the following types of content: details on the construction of experimental instruments, fragmentary or incidental data, and methodological developments relating primarily to in-house technical operations. Distribution is primarily to personnel engaged in research for ARI.

R&D Utilization Reports briefly document the ways in which results of contract research have been used. They are written by the ARI technical monitor of the contract, as the person most knowledgeable of both the research and its utilization. Distribution is the same as for Research Reports.

Special Publications (P series) are not reports of research but valuable results of research. Examples are the guidebooks for developing criterion-referenced tests or Army training literature.

Technical Reports are prepared by a contractor or grantee as the culmination of contract research developed and technically monitored by ARI. After approval by the ARI technical monitor as meeting professional standards, TRs are printed and distributed by ARI. Distribution depends on the nature of the report--it may be that of a Research Report (A series) or of a Research Problem Review (B series).

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Initial distribution of each report is made directly by ARI. Research Reports, R&D Utilization Reports, and Technical Reports in the A series are distributed primarily to operational and research facilities and their sponsors in the Defense Department, to other interested Government agencies, to the Defense Documentation Center (DDC), and to the Library of Congress, which in turn distributes to federal depository libraries. Technical Papers are distributed primarily to technically trained research workers, including those reached through DDC and Library of Congress channels. Special publications (P series are distributed directly to primary users and may be deposited in DDC; users may be given permission to reprint as needed.

Qualified requesters may obtain copies of reports deposited in the Defense Documentation Center directly from DDC (Cameron Station, Alexandria, Va., 22314). Anyone may obtain these documents from the National Technical Information Service (NTIS), Department of Commerce, Springfield, Va., 22151. The six-digit AD number given for each report is the accession number that should be used in requesting documents from DDC or NTIS.

Copies may also be obtained on loan from depository libraries in many metropolitan and university centers. A list of these libraries is given at the end of this publication.

Research Problem Reviews, Research Memorandums, and Technical Reports in the B series are operating, intra-agency administrative documents; therefore, they are rarely placed in DDC and NTIS. File copies may be maintained at ARI offices in Alexandria, Va., after the initial printed supply has been exhausted. These documents are summarized in this publication to provide a complete and more permanent record of the research projects.

ABSTRACTS OF RESEARCH PUBLICATIONS

Research Reports

RR 1187. Banks, J. H., Hardy, G. D., Jr., & Scott, T. D. (ARI); & Jennings, J. W. (Manned Systems Sciences). Elements of a battalion integrated sensor system: Operator and team effectiveness. December 1975. (AD A025 811)

Effectiveness of a system can be enhanced in many ways, and human performance can be meaningfully evaluated only in interaction with other system elements. The ARI Field Unit at Fort Ord and Presidio of Monterey, Calif., has developed scientific instruments, techniques, and methods for testing performance under simulated tactical combat conditions. Together, the methodology, procedures, and sample environment constitute a standardized test and evaluation capability or systems measurement bed. Components of major subsystems may be varied in this measurement bed and the resulting changes in system performance recorded.

The research reported here is part of a long-range program to enhance the effectiveness of company and battalion ground surveillance elements through studies employing radars, night vision devices, and other sensors in combination as an integrated system. Requirements for an effective system, utilizing several combinations of devices, were reported in Research Report 1183, "Selected Elements of a Battalion Integrated Sensor System: Device and Mix Effectiveness." In the phase reported here, devices were employed singly and in combination in support of an infantry battalion in a static defense area (simulated). Accuracy, timeliness, and alternate strategies of detection were systematically investigated under conditions of independent search, team search, low levels of illumination, and radar operator training.

No single surveillance device met all needs for detection, location, and identification when used under realistic operating conditions. Two devices, however, were found to possess complementary characteristics. The PPS-5A radar detected and located targets well; the AN/TVS-4 Night Observation Device (NOD) was better in identifying targets. Use of additional devices did not improve mix performance. Operational effectiveness was increased by use of this mix in a team configuration with a team chief exercising coordination and control.

RR 1188. Knerr, C. S., Downey, R. G., & Kessler, J. J. Training individuals in Army units: Comparative effectiveness of selected TEC lessons and conventional methods. December 1975. (AD A022 034)

The development of suitable performance-oriented training and testing procedures for individuals is a primary mission of research in support of the Army's Enlisted Personnel Management System, in which increased emphasis is given to training beyond initial entry-level courses. The Army has developed a system of self-paced audiovisual lessons--the Training Extension Course (TEC)--designed to upgrade

individual skills and to help commanders at the unit or company level conduct individual proficiency training.

The present experiment compared the effectiveness of TEC training with that of conventional Army classroom instruction, evaluating both against a baseline level of performance. From units at two Army posts and from a National Guard division, 500 soldiers were assigned to training in five different courses. Participants in each course were randomly divided into three equal groups: one received TEC lessons, a second conventional instruction, and a third no special training (baseline performance). A hands-on performance test was administered after training.

TEC groups performed better than conventionally trained and baseline groups on tasks emphasizing reasoning and information. TEC and conventional groups performed equally well and better than the baseline participants on tasks of skill in equipment and psychomotor activities. TEC was as effective for soldiers with low general mental ability as for those with high mental ability. Performance of the conventionally trained groups was more variable than that of the TEC groups.

RR 1189. Osborn, W. C., Ford, J. P., Moon, H. L., & Campbell, R. C. (Human Resources Research Organization); & Root, R. T., & Word, L. E. (ARI). Development of new training concepts and procedures for unit trainers. March 1976. (AD A024 207)

An experimental program of instruction (UTRAIN) was developed to prepare officers and NCOs to conduct performance-oriented training in their own units. A prototype 10-hour course consisted of 3 hours of lectures and demonstrations on the principles and techniques, presented to the entire class, and 7 hours of practice. For the 7 hours, 10-man groups used a prepared list of suitable short tasks. Each person was assigned a specific task, given 2 hours to prepare a 20-minute presentation, and took a turn teaching the task to the others in the group. Performance tests determined whether teaching had been effective.

Infantry School observers recommended that the course be implemented in the Infantry School's Officer Basic Course, and a majority of the first Officer Basic Course class felt it was effective and useful. Differences in effectiveness between UTRAIN and conventional lecture-oriented instruction seemed to depend on type of task. In a small exploratory study, the two methods were equally effective on manipulative tasks; the conventional method with experienced instructors was slightly better on some mental tasks. The UTRAIN course has been implemented in the Infantry Officer Basic Course at Fort Benning, Ga., and adapted for NCO, school faculty, and National Guard courses. The instruction manual is published as ARI Special Publication P-75-2, "Course Outline: Instruction for Unit Trainers in How to Conduct Unit Training."

RR 1190. Gainer, C. A. (ARI); & Sullivan, D. J. (Anacapa Sciences, Inc.). Aircrew training requirements for nap-of-the-earth flight. August 1976. (AD A030 420)

In nap-of-the-earth (NOE) flight, a helicopter moves at variable speeds and at less than treetop height, using natural features of the terrain for concealment--a dangerous procedure requiring great skill in flying and navigation. The present research, conducted at the Army Aviation School, Fort Rucker, Ala., identified specific areas in which NOE aircrew training might be improved most readily.

Information from agencies and operational units directly concerned with NOE operations provided the data for analysis of NOE mission requirements, aircrew task analysis, and performance requirements for emergencies. The task analyses, tabulated in Research Memorandum 76-2, were structured progressively from the most general level (battle scenario) to the most specific (explicit task requirements). Training objectives derived from the analyses were verified by operational personnel and compared with objectives of existing NOE training programs. Together with results of a parallel review of flight training technology (see Research Problem Review 76-3), findings were the basis for suggested improvements in NOE aircrew training.

Problems in navigation and orientation are the major hazards in NOE flight, and suggestions for training improvements concentrated in these areas. Suggestions for ground-based training aids were visual (cinematic) simulation, a map-interpretation manual for NOE use, and techniques for ground-level orienteering. For flight-based training, such procedures as more practice in reorientation, equipment such as map displays, and policies such as flying over more varied terrain were suggested.

Special Reports

Special Report S-3. Uhlaner, J. E. Management leadership in system measurement beds. August 1975. (AD A021 888)

Drawing on the cumulative findings of three decades of research dealing with the measurement, prediction, and development of leadership behavior in a variety of combat and technical/managerial environments, this report examines questions of management leadership, with emphasis on selection and utilization.

Variables interacting in leadership behavior are analyzed under several different dimensions, one of which is the distinction between cognitive and noncognitive aspects of human performance. The cognitive aspects deal with logic and facts that are demonstrably right or wrong, the noncognitive with values and emotionally colored value judgments. The cognitive aspects are dominant in selection and school tests, school training, and human factors engineering. Noncognitive aspects are

dominant in selection ratings and rankings, situational training experience, and organizational variables at the workplace. A second basic distinction is style of management or leadership--authoritarian versus participative--and interaction of style with other factors.

Simulated situational measures of effects of these and other interactive variables comprise the systems measurement bed developed to study variations in complex systems, including the Army's personnel systems and subsystems.

Systems research in a simulated military leadership environment has differentiated two primary domains of Army leadership, combat and technical/managerial. Eight general factors have been delineated, of which the first six are predominantly noncognitive--technical/managerial, combat leadership, team leadership, command of men in a combat environment, mission persistence (which cuts across both domains), and executive direction. Tactical staff skills and technical staff skills are predominantly cognitive in nature.

Special Report S-4. Shriver, E. L., Mathers, B. L., Griffin, G. R., & Jones, D. R. (Kinton, Inc.); & Word, L. E., Root, R. T., & Hayes, J. F. (ARI). REALTRAIN: A new method for tactical training of small units. December 1975. (AD A024 030)

REALTRAIN is an improved, low-cost tactical training and evaluation technique for use in Army combat unit training exercises. Realistic, two-sided, free-play tactical training employing recognized principles of learning is achieved through simulated combat engagement situations.

For infantry, a soldier with a 6X telescope mounted on an M16 rifle attempts to identify 3-inch-high numbers on the helmet of his "enemy." When the number is identified, he fires a blank round and reports the "hit" to a controller who is in constant communication with controllers on the other side; then the "enemy" is withdrawn from action. An After Action Review, in which the participants describe and discuss their roles in the action, reinforces the lessons learned. The method is enthusiastically accepted and the learning of appropriate behavior is rapid. REALTRAIN principles have also been successfully adapted to armor and antiarmor units.

This report describes the development of the REALTRAIN training method, which incorporates the casualty assessment techniques into an appropriate learning environment; discusses in detail major aspects of the training method; presents data on the effectiveness of the method and its acceptance by men in units in the field; and describes its utilization in Army units throughout the world. This report also discusses future research in the refinement and extension of the REALTRAIN method.

Technical Papers

TP 264. Hurst, P. (Institute for Research); & Cook, R. F., & Ramsay, D. A. (ARI). Assessing the prevalence of illicit drug use in the Army. July 1975. (AD A013 389)

Development of an index of the prevalence of drug abuse was the first step in research on social and organizational factors associated with drug abuse in the Army. Most official Army estimates of prevalence were based on results of random urinalysis. Self-report anonymous questionnaires were offered as an alternate method of assessment.

A brief self-report questionnaire was administered from March through June 1973 to personnel in TO&E units in the United States, Germany, and Korea. Usable responses (71%) were received from over 17,000 enlisted personnel. Results were compared with results of random urinalysis, the basis for most official Army estimates of drug abuse, for the same period. Percentages of laboratory positives were about one-third of the percentages predicted statistically from the self-reports. Variation over installations and drug types suggested that more than simple self-report exaggeration was involved. Although both methods carried some error, it was possible either that the self-reports were inflated or that the urinalysis produced underestimates. For one thing, the percentage of individuals actually using identifiable drugs in a given period would be greater than the percentage of chemical positives for that period, since the sporadic user would not test positive the entire time. From these and earlier studies, self-report methods appeared to be less sensitive than urinalysis to systematic variations in enforcement practices, and their bias appeared relatively constant across posts and commands.

A base commander's interest in deterrence and treatment would be best served by random urinalysis. Headquarters commanders wanting a reasonably accurate estimate of illicit drug use could best use a brief, anonymous self-report questionnaire.

TP 265. Bowen, R. J., Halpin, J. A., Russell, P. T., & Staniforth, B. J. (Bolt, Baranek and Newman, Inc.). Tactical Order of Battle: A state-of-the-art survey. October 1975. (AD A018 368)

In military intelligence, Order of Battle (OB) is defined as the identification, strength, command structure, and disposition of the personnel, units, and equipment of a military force. The fundamental role of tactical OB is to inform the commander of the detailed nature of enemy forces with which the command is in contact or may reasonably expect to be. OB intelligence includes both descriptive information on enemy activities and estimates of the capabilities of enemy forces. OB analysis uses information supplied by others and integrates it in support of command decisionmaking and planning.

In practice, until recent times the OB section examined trends and patterns of enemy activity in an attempt to discern longer-range implications. G2 Operations intelligence personnel were concerned with the immediate consequences of enemy activities. New doctrines and procedures are designed to make the OB section a current intelligence production activity based on all-source material. The state-of-the-art survey provided a basis for improving the processing techniques and methods of estimation used in OB analysis. Data were obtained from official documentation, authoritative references, contacts with seven divisional headquarters, and other appropriate commands and operations combat personnel. The survey covered the historical development of OB; the role, function, and operations of the division OB section; an examination of OB factors; and military opinions on OB. Problem areas were identified and a basis provided for research designed to improve the processing of OB intelligence information. See also TP 271, A Questionnaire-Based Analysis of Order-of-Battle Elements.

TP 266. Ross, N. P. A model for using qualitative variables as covariates in the analysis of covariance. July 1975. (AD A014 936)

The powerful randomized block (RB) two-way analysis of variance design has traditionally been a preferred model for much psychological research. The RB design, however, has the stringent requirement that the sample population be strictly defined and stratified beforehand, a requirement more appropriate in a controlled laboratory environment than in many Army field situations. An alternative model was sought, which would be equally efficient and which would eliminate the RB requirement for a priori stratification and sampling and at the same time retain the RB's ability to handle categorical concomitant variables: that is, a statistical design with the advantages of the classic RB method without the operational disadvantages.

The model selected for comparison and testing was a modified analysis of covariance (ANCOVA) design not requiring previously selected stratified samples and yet incorporating the ability to handle categorical variables--the categorical analysis of covariance (CANCOVA). In an empirical comparison, a Monte Carlo program simulated fixed effects analysis with two levels of treatment, one criterion variable, and a qualitative concomitant variable with three design types. The parameters, which varied for each design type, were sample size, ratio of numbers of row observations, eta (η), and magnitude of treatment effects. With large samples, the RB and CANCOVA designs yielded the same information in terms of component sums of squares. With small samples, the power relationship is a function of sample size, design type, and amount of heterogeneity. Empirically no practical difference was found between the two methods in large samples.

TP 267. Hoyt, W. G., Butler, A. K., & Bennik, F. D. (System Development Corporation). Application of tactical data systems for training: DEVTOS feasibility termination and selection of an instructional operating system. October 1975. (AD A017 436)

When the Army's tactical data systems are not required for operational use, they could be used in support of unit and individual training. The feasibility of such use was established in the research reported here. Analysis of an existing Army tactical data system--the Developmental Tactical Operations System (DEVTOS) at Fort Hood, Tex.--determined that it had the necessary characteristics to support computer-aided instruction (CAI). From an analysis of 23 CAI programs, PLANIT (Programming Language for Interactive Teaching) was identified as the most appropriate in relation to DEVTOS. From existing versions of PLANIT, a viable system was developed which interfaced with DEVTOS and provided suitable instruction programs. Portability of the system permits it to be installed on a variety of different computers with relative ease.

TP 268. Mohr, E. S. Acceptability of associate ratings at Branch Basic schools. October 1975. (AD A017 437)

Previous ARI research has shown associate ratings to be reliable predictors of leadership potential. To assess the acceptability of the ratings among officers, a 27-item survey designed to reveal attitudes regarding the value and usefulness of the ratings was administered to 1,647 members of 27 Officer Basic classes in 11 branches. Acceptability of associate ratings was generally low. In branches in which there was greater familiarity with associate ratings, opinions ranged from neutral to favorable.

Chaplains, engineers, and infantry officers approved use of information from the ratings for self-improvement; they were neutral about its use for leadership prediction. Officers from all branches expressed the opinion that associate ratings should not be used for selection, assignment, or promotion, and should not be part of official records. The most acceptable use was in combat training courses; practical field exercises were judged to be the best measure of leadership potential.

TP 269. Gilbert, A. C. F. Dimensions of certain Army officer positions derived by factor analysis. December 1975. (AD A019 002)

A new approach to the description of Army officer duty positions is to cluster functionally related tasks into "duty modules." The efficacy of this approach was assessed in this analysis. Task-analysis data were collected from 403 Infantry officers and 74 Quartermaster officers in representative duty positions described by 93 duty modules; data reflected duties both under actual or simulated combat conditions

and under garrison conditions. These data were factor analyzed by the principal components method, and the factors were rotated by the varimax method.

For both combat and garrison conditions, Infantry and Quartermaster officer duty positions can be described by six factors that reflect the functions of (a) unit command, (b) operations and training, (c) manpower and personnel, (d) logistics, (e) intelligence, and (f) troop welfare, in that order of importance for combat conditions. Under garrison conditions, manpower and personnel functions rank second, operations and training functions, third.

The duty module concept was confirmed as a logical and parsimonious strategy for defining Army officer duty positions and for systematizing relations among positions. See also Technical Paper 273.

TP 270. Nordlie, P. G. (Human Sciences Research, Inc.); & Thomas, J. A., & Sevilla, E. R. (ARI). Measuring changes in institutional racial discrimination in the Army. December 1975. (AD A023 112)

Institutional racial discrimination is defined as those standard practices of an organization that produce consistent discrimination--a difference in what happens to people that (a) is correlated with skin color, (b) results from the normal functioning of the organization, and (c) operates consistently to the disadvantage of persons of a particular skin color. As quantitative measures of institutional racial discrimination, specific Representation Indexes compare the actual and the expected numbers of blacks in a given situation or with a given characteristic (e.g., the actual versus the expected number of black Army officers), where the expected number is that which would occur by chance if skin color were not a factor. By calculating indexes at different times, changes in amount and direction of institutional discrimination can be detected.

Indexes were computed for 58 dimensions of institutional racial discrimination in the Army over the 11-year period from 1962 to 1973, based on data from Army personnel files. By 1973 substantial change had occurred toward an equitable distribution of blacks across all ranks. Skin color still appeared highly related to type of job in the Army for both officer and enlisted personnel, although overall patterns showed the relation declining. Where data were available for prior years, the overall tendencies were toward reduced discrimination on most dimensions. Comparison of 1972 data from the Army and other services indicated much less discrimination in the Army.

TP 271. Coates, E. N., & McCourt, A. W. (Westinghouse Electric Corporation, Center for Advanced Studies and Analysis). A questionnaire-based analysis of Order-of-Battle elements. January 1976. (AD A021 956)

In response to a questionnaire, field-grade officers assessed the perceived value to the user of the elements of Order of Battle intelligence--composition, disposition, strength, training, tactics, logistics, combat effectiveness, and miscellaneous--and the components of these elements.

The 1,252 officers responding provided ratings under each of four possible conditions of war--prehostility, low intensity, medium intensity, and high intensity. Officers generally agreed on the relative value of the elements. Intelligence on enemy disposition was consistently rated the most valuable element under all four war conditions. Information on enemy strength, composition, combat effectiveness, and tactics was also considered crucial. The perceived value of logistics intelligence increased with increasing intensities of war, whereas the values of tactics and training were rated highest under low-intensity conditions. Military Intelligence branch officers valued every element except training higher than did Combat Arms officers, and Combat Arms officers valued every element higher than did officers in support branches. The results provide the basis for further examination of requirements in intelligence collection, production, and dissemination under various conditions of war. See also Technical Paper 265.

TP 272. Cohen, S. L., & Turney, J. R. Results of an organizational diagnostic survey of an Army field facility work environment. January 1976. (AD A020 934)

Organizational effectiveness research develops diagnostic instruments to identify problem areas, intervenes with organizational development techniques to correct the problems, and, finally, evaluates the intervention results in terms of productivity and job satisfaction. The ultimate goal of the research program has been to develop a set of carefully validated diagnostic instruments and organizational effectiveness techniques that can be used Army-wide with a minimum of professional intervention.

A diagnostic Work Environment Questionnaire (WEQ) was developed and validated over a 3-year period at an Army field installation. The WEQ elicits from supervisors and subordinates their attitudes and perceptions of job duties, training, performance standards and consequences, and of their organizational supervision, work group, job importance, and feedback, using job-specific items that can readily be adapted to a variety of duties and organizations. Three versions were tailored to fit a supervisory NCO position and two subordinate positions. Data from a 1972 pretest and 1973 WEQ survey supplemented findings from the 1974 survey described here.

Seven major problem areas were identified: peer group norms that fail to encourage good performance, insufficient feedback, need for training in supervisory techniques, role ambiguity and conflict, inadequate intergroup communication patterns, lack of clear performance reward relationships, and ambiguous performance standards. A program of active intervention was implemented. A resurvey of the installation indicated a decrease in certain problems and an increase in job satisfaction and performance. See also Technical Paper 275.

TP 273. Duffy, P. J. Development of a performance appraisal method based on the duty module concept. August 1976. (AD A030 702)

A duty module is a standardized, codifiable cluster of important related tasks. The cluster is coherent, distinctive, self-contained, and may apply to a number of different job positions. As an experimental system for use in the Officer Personnel Management System (OPMS), duty modules are intended to codify and provide useful, accurate job description information to resource planners, assignment officers, and others in ways not previously practical.

Duty modules applicable to the 30 entry-level specialty fields of the OPMS were analyzed to determine the salient generalizable job performance dimensions underlying them. Eight such dimensions were identified, and their applicability to 128 entry-level officer positions was determined. The eight job performance dimensions were incorporated in the Job Proficiency Appraisal Form, an experimental instrument which assesses a ratee's level of performance on each dimension, both upon entry into a job and at some later time, in order to partially control for changes in performance as a function of experience. The form allows ratings to be made by the immediate supervisor, another supervisor familiar with the ratee's work, and one or more of the ratee's associates. See also Technical Paper 269.

TP 274. Granda, T. M. A comparison between a standard map and a reduced detail map within a Simulated Tactical Operations System (SIMTOS). June 1976. (AD A028 752)

Computerized graphics can be extremely useful in military information-gathering and decisionmaking systems. However, standard Army topographic maps are too detailed for use in cathode ray tube (CRT) displays. Detail must be greatly simplified for this purpose. The effect of such reduction on the efficiency of information gathering and tactical decisionmaking in a simulated tactical operations system (SIMTOS) was explored at two echelon levels (division and regimental).

Reduced-detail maps and standard Army maps were used by 20 mid-level Army officers in completing planning and combat requirements specified in the current SIMTOS offensive scenario. A 2 x 2 analysis of variance design was used to evaluate the effects of detail level

and echelon. No significant differences in performance, amount of information requested, or time to access data frames were noted between users of reduced-detail maps and standard maps. Divisional officers asked for significantly more information in the planning phase than did regimental officers. In the combat phase, officers who had previously acted as division level operations officers made significantly better combat effectiveness scores than those who had acted as operations and training officers at regimental level. Some users of the reduced detail maps judged their maps inadequate. However, those who considered the map inadequate appeared to perform as well as those who did not.

Results suggest that reduced detail maps can be substituted for standard maps at division level in SIMTOS to satisfy hardware and software requirements without degrading performance effectiveness.

TP 275. Turney, J. R., & Cohen, S. L. The development of a Work Environment Questionnaire for the identification of organizational problem areas in specific Army work settings. June 1976. (AD A028 241)

The aim of organizational effectiveness research is to increase human performance effectiveness in an organization and to improve teamwork and job satisfaction. A three-step sequence develops diagnostic instruments to identify problem areas, intervenes with techniques to correct the problems, and finally evaluates the intervention results in terms of productivity and job satisfaction. The Work Environment Questionnaire (WEQ) is a diagnostic instrument which also evaluates the results. The instrument, as developed and validated over a 3-year period at an Army field installation, consists of three questionnaire sections, one for a supervisory noncommissioned officer position and two for subordinate enlisted jobs. The WEQ elicits from supervisors and subordinates their attitudes and perceptions of their job duties, training, performance standards and consequences, and of their supervision, work group, job importance, and feedback. The job-specific terms used can be adapted readily to a variety of duties and organizations.

This report details the development and validation of the WEQ. ARI Technical Paper 272 analyzes the WEQ responses which delineated specific areas for intervention in the field station. A resurvey of the station indicated that the intervention was instrumental in decreasing problems and increasing job satisfaction and performance. An adaptation of the WEQ for diagnostic use in the Army Air Defense Command is described in Research Problem Review 75-1.

TP 276. Kessler, J. J., & Mietus, J. R. The Army Adaptation Inventory: Development and standardization. September 1976. (AD A032 658)

The Army ROTC Evaluation System selects young men and women likely to become good officers for Regular Army commissions and placement. The Army Adaptation Inventory (AAI) is an on-campus part of this evaluation system. The self-report paper-and-pencil instrument measures an applicant's military orientation, motivation, and drive. It replaces the ROTC Inventory in the Evaluation System.

Attitude and self-perception items, identified in previous research as measuring military career potential, were administered to 600 ROTC cadets and 323 Army officers. Item analysis developed highly reliable scales measuring military orientation, motivation, and drive. Correlation coefficients showed the scales were consistent with peer and evaluator ratings of the ROTC cadets at Advanced Summer Camp. For the operational form, the instrument was revised, administered to another sample of 924 ROTC cadets, and standardized to yield Army Standard Scores. Data show that the instrument yields reliable measures, with no mean score differences between men and women.

Research Problem Reviews

RPR 75-3. Temkin, S., Conolly, J. A., Marvin, M. D., & Valdes, A. L. (Research for Better Schools, Inc.); & Caviness, J. A. (ARI). A cost assessment of Army training alternatives. August 1975.

Under the Enlisted Personnel Management System, the training given individuals after their initial entry-level courses is emphasized, particularly that provided at the unit or company level. The Army has developed a system of self-paced audiovisual lessons--the Training Extension Course (TEC)--designed to upgrade skills and to help commanders conduct individual proficiency training. This report compares the estimated cost of TEC training with that of conventional Army classroom instruction. Costs are given for current and projected utilization of the program. ARI Research Report 1188 evaluates the comparative effectiveness of the two systems, thus providing a cost-effectiveness view. Cost of TEC individualized instruction using either cassette tape or audiovisual aids was projected to be less costly than conventional instruction with increased volume of use.

RPR 76-1. Bauer, R. W., & Walkush, T. J. Crew station and skill level assessments for the MICV/ARSV turret. March 1976.

The ARI Field Unit at Fort Knox, Ky., is primarily concerned with training and crew performance of Armor personnel. This report analyzes turret crew functions in the Mechanized Infantry Combat Vehicle/Armored Reconnaissance Scout Vehicle (MICV/ARSV) during contact with the enemy. The objective was to determine optimum turret crew size and minimum

crew skill levels for the patrol or squad leader to exercise command and reconnaissance functions.

Detailed analysis of three combat situations, each a mission segment from previously developed scenarios, indicated that two men are needed in order to control the weapons and perform reconnaissance functions at the same time. Reviews of updated lists of crew tasks and the judgment of experienced Armor NCOs determined minimum skill requirements. Skill Level 3 is minimal for squad leaders or vehicle commanders. Skill Level 2 is appropriate for the gunner/observer in the two-man turret crew. These skill level requirements must be supplemented by training for the advanced subsystems and weapon systems contemplated for this equipment.

RPR 76-2. McDowell, S. F. Voluntary racial separation by blacks in the Army. September 1976.

This research was undertaken to examine the characteristics and causes of voluntary, off-duty segregation by black soldiers in locations such as mess halls and clubs. Information was obtained by the ethnographic technique of participant observation, in which researchers live and work among the groups being studied. Observations were supplemented by formal interviews, examination of the military and social context, and accepted social research findings.

At a combat support battalion in the south-central United States, the prevailing racial patterns were desegregation on the job as required by Army regulations and voluntary separation off the job. In part, the off-duty patterns reflected biracial practices in civilian society, historically initiated by whites and imposed upon blacks. The patterns probably also reflected the efforts of black soldiers to meet their own social and emotional needs. The groupings observed in this study were not considered threatening to the Army in themselves.

RPR 76-3. Roscoe, S. N. (University of Illinois Institute of Aviation). Review of flight training technology. July 1976.

The state-of-the-art of aircrew training technology is reviewed to identify areas in which nap-of-the-earth (NOE) aircrew training might be most readily improved, particularly by using simulators.

Modern flight simulators featuring complex visual and motion systems have demonstrated effective transfer of training, although they have not been submitted to rigorous evaluation. The key requirement in the design and use of simulated flight trainers is cost effectiveness. The cost of the device, and the operating time associated with its use, must be no greater than the cost of the flight time required to achieve the same training in actual aircraft.

Present flight simulators are much less useful in NOE training than in general helicopter pilot training because they cannot properly reproduce the visual field outside the cockpit. However, a combination of cinematic simulation and air training appears to be a promising cost-effective method of developing NOE visual perception skills. Of other innovations in pilot training, computer-assisted instruction can be used for any lecture-type teaching; measurement of residual attention could be useful in assessing NOE pilot performance. Automated measurement of performance could provide objective assessments once the pivotal measures that correlate highly with total performance are identified.

ARI Research Report 1190 presents the conclusions and suggestions for NOE training, and Research Memorandum 76-2 contains the detailed task analysis and training objectives from which these conclusions were drawn.

RPR 76-4. Bauer, R. G., & Stout, R. L. (Bendix Applied Sciences Division); & Holz, R. F. (ARI). Predicting military delinquency. August 1976.

Military delinquency could be reduced by early identification of soldiers likely to become disciplinary problems. ARI Research Report 1185 summarizes ARI research on military discipline and delinquency through early 1975. This report and Research Problem Review 76-5 summarize a broad-based project assessing a variety of social-psychological predictors of delinquency in relation to discipline problems in the Army. This report focuses on correlates of individual delinquency, Research Problem Review 76-5 on defining and assessing unit discipline.

Data were collected by anonymous self-administered questionnaires, from 1,564 enlisted personnel stationed worldwide and selected to reflect the diverse composition of the Army.

In the sample studied, the social background variables of preservice delinquency, school expulsions, civilian arrests, and difficulty in holding a job were most predictive of self-reported AWOL, accounting for 16.6% of the variance. While the research confirmed previous findings that individual preservice characteristics do correlate with Army delinquency, the predictive utility of screening on such characteristics appears questionable.

RPR 76-5. Bauer, R. G., & Stout, R. L. (Bendix Applied Sciences Division); & Holz, R. F. (ARI). Developing a conceptual and predictive model of discipline in the U.S. Army. September 1976.

Objectives were to develop and test conceptual and predictive models of Army discipline and to develop reliable measures of unit discipline and its indicators that could help Army leaders assess the state of discipline and delinquency in their commands.

Models were constructed from the perceptions of 291 active-duty Army officers and enlisted personnel, obtained through in-depth interviews. A questionnaire gathered data to test these models from a sample of 1,564 enlisted personnel (see Research Problem Review 76-4).

Three conceptualized components of military unit discipline were distinguished--unit performance, unit appearance, and unit conduct. Scales measuring esprit de corps and leadership strongly predicted unit performance and correlated with unit appearance. Unit conduct was best predicted by the esprit de corps and degree of unit racial discrimination. Environmental factors subject to Army management affect discipline and delinquency in units. Measures of environmental circumstances can supplement official records of courts-martial and honors as indicators of the state of discipline in Army Units.

RPR 76-6. Bell, D. B., & Houston, T. J. The Vietnam era deserter: Characteristics of unconvicted Army deserters participating in the Presidential Clemency Program. July 1976.

The Office of the Deputy Chief of Staff for Personnel, executive agent for the Presidential Clemency Program, asked ARI to analyze the data on Army deserters participating in the program, in order to learn more about Army deserters and the nature of desertion during the Vietnam period. Sources of data included the Enlisted Record Center predesertion records, clemency program records, and interviews with deserters and others in the program by the Army mental health staff.

Demographic characteristics of the participants resembled those of other deserters. Nearly all were enlisted men. Compared with their contemporaries, deserters were less educated, scored lower on the AFQT, and were less likely to be white or from the north-central part of the country. Volunteers and younger men were more likely to desert. Their service careers tended to be short. Few (19%) had seen service in Vietnam, and still fewer (1%) had deserted from combat.

Reasons for leaving were generally not associated with the war. Most (50%) said they had left because of personal, family, or financial problems. Most had remained in the United States throughout their absence. As a group, participants were remarkably similar to other deserters. Data for nonparticipants were taken from Army records, for the comparison.

The report contains about 75 cited references and a selected bibliography on AWOL and desertion.

Research Memorandums

RM 75-5. Downey, R. G. Associate evaluations: Improving field acceptance. July 1975.

In view of the demonstrated validity of associate ratings in major Army schools and courses, the feasibility of extending use of such ratings to additional Army training programs was investigated.

Two classes of the Infantry Officer Basic Course, one given more information and explanations of the associate rating system than the other, were compared on various measures indicating their attitudes toward the rating system. The group given special information on the nature of the ratings generally accepted associate ratings as predictive of future leadership in school, staff, and combat situations, although they still did not consider these ratings to be as acceptable for leadership measurement as other types of school evaluation. Attitudes toward use of the ratings as part of the official record were still somewhat negative. Evidently, the level of student acceptance of associate ratings can be increased through training and group discussion. The viability of an operational program is a function of its acceptance. It would seem that even with less than 50% acceptance, students can provide reliable evaluations of their peers.

RM 75-6. Mohr, E. S., & Helme, W. H. An analysis of 30 scales of leadership in a simulated combat situation. July 1975.

As part of ARI's long-term Officer Prediction program, a detailed and complex analysis of data derived eight clearly interpretable factors of performance in a simulated combat exercise (reported in Technical Research Report 1172). For the analysis in this report, an approximation to second-order factoring was performed to determine whether consistency with the original eight leadership dimensions would be maintained. The analysis dealt with the original intercorrelations from unweighted raw scores on the 30 scales established on the basis of the 30 orthogonal factors originally derived. It yielded a five-factor solution accounting for 40% of the total variance. The five factors closely parallel the original eight, supporting the robustness--and generalizability--of the earlier findings.

RM 75-7. Savell, J. M. (ARI); & Collins, B. (Contemporary Research, Inc.). Soldiers' attribution of contemporary vs. traditional sex-role attitudes to themselves and to others. July 1975.

Data for this analysis were collected as part of a larger research effort to develop an instrument that would measure attitudes toward women in the Army (see also Research Memorandum 75-3). In January 1974, an anonymous 174-item questionnaire was administered to a combined sample of approximately 800 soldiers--officers and enlisted, men and

women--at Fort Dix, N.J., Fort Lewis, Wash., Madigan General Hospital at Fort Lewis, and Fort Meade, Md. Respondents made a forced choice between a statement characterizing the favored role of women in society as traditional and a statement characterizing it as contemporary (egalitarian). Choice was made as to self-role and as attributed to other referents.

The group most often seen as contemporary (85%) was referred to as the "majority of women in the Army." The group least often seen as contemporary (29%) was the "majority of men in the Army." Women were less likely to say that soldiers were contemporary in sex-role attitudes than were men. The experimenter cautions that the extreme positions as expressed in the forced-choice statements may have obscured some moderation in attitudinal patterns.

RM 75-8. Seeley, L. C., & Fischl, M. A. Development of performance tests as supplementary enlistment screening measures: An interim report. July 1975.

As a first step toward developing a supplementary screening test for marginal personnel, three general noncognitive areas were identified in which it appeared that performance testing could tap motivation and personality characteristics related to acceptable soldier performance--dependability, cooperativeness, and willingness to push oneself physically. Preliminary testing and analysis led to selection of a number of items showing promising relationships with performance of Category IV personnel in Basic Combat Training performance.

RM 75-9. Downey, R. G., Duffy, P. J., & Shiflett, S. Criterion performance measures of leadership and unit effectiveness in small combat units. August 1975.

This paper describes development of criterion measures as a preliminary procedure step in a larger research program on leadership effectiveness in small military units. First, items were constructed sampling the domains of individual and unit performance, job satisfaction, and morale. Questionnaires based on selection from these items were administered to independent groups participating in a 2-week field training exercise of the 12th Special Forces Reserve Group (Airborne). Evaluative data were gathered from four sources--detachment members and three sources external to the detachments--guerrillas, evaluators, and controllers. Data were factor analyzed both for the detachment members and for the external sources combined. For the detachment group, six scales were defined: Unit Performance, Job Satisfaction, Leader Effectiveness, Group Cohesion, Individual Performance, and Individual Effort. The seven scales defined for the external sources were Morale, Early Mission Effectiveness, Mission Effectiveness, Esprit, Mission Support Effectiveness, Leader Effectiveness, and Effectiveness of Plans and Preparation.

RM 75-10. Segal, D. R. (ARI); & Nordlie, P. G. (Human Sciences Research, Inc.). The measurement of institutional discrimination. August 1975.

Institutional discrimination refers to a pattern of treatment of a subgroup that persists over time. A matrix of discriminatory treatment over time can be used to identify patterns of discrimination within an institution. This paper presents a method of measuring institutional discrimination and computing a representation index. Examples use data on the representation of blacks among officers and enlisted combat personnel. The representation index can be used to measure the role of other minority groups in the Army and in other institutional settings as well.

RM 75-11. Swezey, R. W., Pearlstein, R. B., & Ton, W. H. (Applied Science Associates, Inc.). Criterion-referenced testing: A discussion of theory and practice in the Army. December 1975.

In the development of the Guidebook for Developing Criterion-Referenced Tests, published as Special Publication P-75-1 by ARI, a major preparatory step was a critical review of prior research and technical and theoretical literature on criterion-referenced tests. The first part of this report synthesizes that review into a comprehensive discussion of the state of the art, reliability and validity, methods of construction including simulation techniques, and various aspects of the utilization of criterion-referenced testing; 97 references are cited. The second part of the report describes a survey of the application of criterion-referenced testing at a number of Army installations. Over 150 hours of interviews were conducted to assess the extent of criterion-referenced testing for various purposes and to discuss concepts and problems encountered in its use.

RM 75-12. Segal, D. R., & Daina, B. L. The social representativeness of the volunteer Army. December 1975.

The Army has the goal of recruiting a military establishment broadly representative of American society. This report compares the social background of volunteer noncommissioned soldiers using data derived from the Army Quarterly Survey of November 1974, with characteristics of the population of eligible military age derived from U.S. Census population surveys, including monthly current surveys. Points of comparison were race, marital status, education, family income, and size of community.

In brief, the broad range of social strata in civilian society seems to be represented in the military, although not proportionately. Although the overrepresentation of blacks is considerable and may account for some of the education and income differentials, most differences are relatively small. Including officers in the military population could reduce the differential.

RM 75-13. Downey, R. G. Factors influencing promotion to Army colonel. December 1975.

This analysis was part of a larger effort to develop improved performance evaluation techniques for use by Army personnel management agencies in making decisions on school and duty assignments and promotions. The present promotion system and the information used by the Promotion Board in making selections were analyzed to discover the factors most closely related to individual promotion decisions. The pattern of correlation strongly supported the theory that the Army's selection, assignment, and promotion systems are a series of interlocking steps, each decision predetermining the next. The system used by the Promotion Board was consistent within branch groups and to some extent across the total group.

RM 75-14. Bedarf, E. W., & Potash, L. M. A field evaluation of the aerial surveillance and reconnaissance manager. December 1975.

A handbook, Aerial Surveillance and Reconnaissance MANAGER, had been developed from an earlier analysis of the responsibilities and duties of Army G2 Air officers, reported in Research Report 1181. The handbook was given field evaluation, using a survey technique. Questionnaires were sent to practicing G2 Air officers, training instructors in pertinent courses, and individuals in closely related positions who had previously received copies of the handbook.

Almost all those responding perceived the primary function of the handbook as that of reference book and/or as a training aid. The major disadvantage cited, that not enough information was given, may have resulted partially from the fact that the manual was designed to serve both purposes.

RM 75-15. Eckerman, W. C., & Williams, J. R. (Research Triangle Institute); & Ramsay, D. A. (ARI). Observations of interrank conflicts at the company level: Drug and alcohol abuse. December 1975.

From 1971 through 1975, ARI conducted research on the behavioral and social aspects of drug and alcohol abuse in the Army. This report considers the relationship between company-level leadership and behavior problems in the unit as expressed in the illicit use of drugs or excessive drinking. As part of the 1974 project, small group discussions were held with a number of company level personnel. Most participants viewed drug and alcohol abuse as widespread. Enlisted personnel tended to hold more permissive attitudes than officers, but did not agree on solutions. There was evidence that the enlisted man of today was viewed as very different from earlier times and that value-attitudinal differences among enlisted personnel, noncommissioned officers, and officers created conditions conducive to conflict.

RM 76-1. Fischl, M. A., Ross, R. M., & Kaczmarek, J. Comparability of Navy Electronics Selection Test and certain Army Classification Battery measures. January 1976.

The Department of Defense has requested that the armed services explore the feasibility of developing an entry test battery common to all the military services. The first stage in the Army's program is to analyze, in an Army population, the relation between Army tests and certain Navy and Air Force tests. In the analysis reported here, four Army Classification Battery tests--Mathematics Knowledge (MK), Science Knowledge (SK), Electronics Information (EI), and Mechanical Comprehension (MC)--were examined in relation to the Navy Electronics Technician Selection Test (ETST). The probability that the Navy ETST and the Army MK tests are interchangeable seems relatively high. Despite different science content, the Navy's General Science set of the ETST correlated .61 with the Army's SK. Both tests include a substantial "g" factor, indicated by respective correlation coefficients of .58 and .65 with the AFQT. The Army and Navy Electrical sets are too dissimilar to be considered for substitution.

RM 76-2. Gainer, C. A. (ARI); & Sullivan, D. J. (Anacapa Sciences, Inc.). Aircrew task analysis and training objectives for nap-of-the-earth flight. February 1976.

Derivation of nap-of-the-earth (NOE) training objectives and identification of the most promising methods of meeting those objectives was an essential step in assisting the Army to improve training for NOE flight. Research Memorandum 76-2 provides a detailed analysis of mission requirements and tasks required of Army helicopter crews in NOE operations. From the task analysis, specific training objectives were formulated. These objectives must be met to achieve the required proficiency in NOE flight. Criticality of task performance is rated in terms of whether successful performance is vital to the mission objective and whether the task must be performed at a precise moment or sequence in time. Contingency performance requirements are also specified.

RM 76-3. Woelfel, J. C., & Savell, J. M. (ARI); & Collins, B. E., & Bentler, P. M. (Contemporary Research, Inc.). A preliminary version of a scale to measure sex-role attitudes in the Army. February 1976.

Preliminary work toward the construction of a basic sex-role attitude scale is to be used in finding out how soldiers, both male and female, react to increased numbers of women in the Army. An 18-item scale and a 7-item scale were developed with respective reliability coefficients of .88 and .78. Examination for construct validity strongly suggested that the primary dimension measured is a traditional versus a contemporary orientation toward women in the Army.

RM 76-4. Mohr, E. S. Preliminary reevaluation of ROTC Ranger Camp standard score conversions. April 1976.

In 1971, the Reserve Officers Training Corps (ROTC) of the Army Training and Doctrine Command instituted a policy of upward conversion of standard scores received by Ranger Camp cadets in relation to scores received by Advanced Camp cadets. The policy reflected the physically more demanding program of instruction at Ranger Camp than at Advanced Camp. In 1975, ARI was requested to check the validity of this conversion table for continued use with Ranger Camp cadets. Because the Army environment had changed considerably, the conversion tables may have no longer reflected accurately the differences between Ranger and Advanced Camp cadets.

The reservations were justified by a comparison of ratings given by professors of military science to cadets planning to attend Ranger Camp during summer 1975 with ratings for the 1971 Ranger and Advanced Camp cadets. While use of the present conversion table appeared questionable, the data obtained were inadequate to make a change.

RM 76-5. Segal, D. R., & Woelfel, J. C. Interacting with women: Interpersonal contact and acceptance of women in the U.S. Army. April 1976.

This research explored the hypothesis that as men become more accustomed to women in the workplace, they become more accepting of them as well. Army findings from recent related studies and results from an exploratory survey conducted in 1974 on 800 soldiers, male and female, at four installations were the basis for an examination of social attitudes assumed to be related to the hypothesis. While the sample lacked representativeness, support was noted for certain apparent relationships.

Female soldiers are more likely than male soldiers to have worked with other women, to have had experience with female supervisors, and to have more female friends. Among male soldiers, only experience with female supervisors was related to perceiving combat infantry roles as appropriate for women, and only number of female friends was related to perceiving the company commander role as appropriate for women.

RM 76-6. Wheaton, G. R., Rose, A. M., Fingerman, P. W., Korotkin, A. L., & Holding, D. H. (American Institutes for Research). Evaluation of the effectiveness of training devices: Literature review and preliminary model. April 1976.

It has become axiomatic among educational/training specialists that the complex processes of learning are not necessarily best served by "hands-on" experience with real equipment. These processes may be better served by a simulation device that can be designed to optimize instructional features such as feedback, scenario freeze, freeze and

playback, sequencing of training steps, and measurement of trainee achievement. With the advent of the systems approach to the design of instruction, simulation has become potentially more important.

This report is the first in a series describing research to develop and validate a method for predicting the effectiveness of training devices. The report presents a preliminary model for predicting one of the most important aspects of training--transfer of training. Also, literature bearing on prediction of device effectiveness is reviewed and evaluated. Previous methods and models are evaluated. General theories of transfer are examined, as are the more specific constructs believed to mediate transfer. Finally, empirical data that describe the impact of specific variables on transfer are reviewed and summarized.

RM 76-7. Downey, R. G., Medland, F. F., & Yates, L. G. Evaluation of a peer rating system for predicting subsequent promotion of senior military officers. April 1976.

This report examines the validity of peer ratings for predicting the promotion of senior military officers. A nomination technique within career groups was used (N = 886). Reliability coefficients were generally in the high 80's and low 90's (split-half). Although there was moderate rater resistance to the operational use of peer ratings, the measures were highly predictive of promotion to General. Findings show that peer ratings can be useful for selections at a more senior organizational level, in addition to their previous use in restrictive training environments.

RM 76-8. McCluskey, M. R., Haggard, D. F., & Powers, R. T. (Human Resources Research Organization). Survey of Army weapons training and weapons training devices. April 1976.

A survey of current training in Army weapons was conducted to provide information on effective and efficient methods of training Army personnel to required levels of proficiency in weapons firing. Focus was on the relative contribution of training device simulation and of live firing to the achievement of proficiency in using weapons. Information was collected largely through survey questionnaires, interviews with training management, training literature, and observation of weapons training. This report, the first of three under project LIVEFIRE, emphasizes training as it is actually conducted rather than as prescribed or programmed. Appendixes present organized information on weapons training in Infantry, Armor, Field Artillery, and Air Defense.

RM 76-9. Kraemer, R. E., & Boldovici, J. A. (Human Resources Research Organization); & Boycan, G. G. (ARI). Job objectives for M60A1AOS tank gunnery. April 1976.

Increased efficiency in tank gunnery training called for specific gunnery job performance objectives. Research at the U.S. Army Armor School at Fort Knox, Ky., developed such a performance data base and examined proposed Army gunnery training specified in Training Circular 17-12-5, Tank Gunnery Training. Job objectives were defined in terms of activities, conditions, and standards to be demonstrated as part of effective performance on the job, as distinguished from training objectives, which describe performance to be demonstrated during training. Job objectives were specified (a) to use to compare with the objectives implied in the new Training Circular gunnery tables and (b) to use as a data base for deriving training objectives and evaluating training effectiveness. Some job objectives not addressed in the Training Circular are noted.

RM 76-10. Frye, C. H. (Northwest Regional Educational Laboratory). TRANSL--The PLANIT Translator Program: Installation and application. May 1976.

PLANIT (Programming Language for Interactive Teaching) is an instructional system consisting of an author language and supporting computer programs for preparing, editing, and presenting subject matter suitable for individualized, computer-assisted instruction (CAI) to students; the system also records all relevant response data for immediate utilization and subsequent analysis. PLANIT was developed over an 11-year period under the auspices of the National Science Foundation. Tests demonstrated that it was feasible to use tactical computers in a stand-alone training mode to satisfy individual and unit training requirements in the Army. It was also found that automated instruction in a field setting was highly acceptable to combat noncommissioned officers and was more effective as a training medium than the traditional study method.

The present series of reports (RM 76-10 through RM 76-14) was produced in response to several explicit user requirements. Need for some type of user training subsystem to support tactical automatic data processing system developments was clearly established during the development phases of the Army Tactical Operations System (TOS). Together, the series of Research Memorandums provides detailed instructions for implementation and operation of PLANIT and auxiliary programs on the AN/GYK-12 computer. This report, the first in the series, contains information needed for installing and operating a program to translate the FORTRAN from the PLANIT system of programs into the TACPOL language for compilation on the AN/GYK-12 computer.

RM 76-11. Bergfeld, R. F., Cilva, J. L., Seid, B., Fletcher, J. M., & Hoff, A. M. (Litton Systems, Inc.). PLANIT support programs--Operator/User Manual. May 1976.

This document presents the general operational information and specific procedures for the operation and use of PLANIT support programs. These programs were developed as part of the installation of the PLANIT (Programming Language for Interactive Teaching) system on the AN/GYK-12 computer.

RM 76-12. Bergfeld, R. F., Cilva, J. L., Seid, B., Fletcher, J. M., & Hoff, A. M. (Litton Systems, Inc.). PLANIT Utility Program--Operator/User Manual. May 1976.

This document presents general operational information and specific procedural instructions for the operation and use of the PLANIT (Programming Language for Interactive Teaching) Utili y Program (PUP). PUP is a collection of highly specialized utility routines developed in support of the application and use of the AN/GYK-12 (TACFIRE) computer installation of PLANIT.

RM 76-13. Bergfeld, R. F., Cilva, J. L., Seid, B., Fletcher, J. M., & Hoff, A. M. (Litton Systems, Inc.). PLANIT support and utility programs--Test procedure. May 1976.

This report provides the procedures for testing the AN/GYK-12 PLANIT support and utility programs to verify that they are functioning according to specifications.

RM 76-14. Bergfeld, R. F., Cilva, J. L., Seid, B., Fletcher, J. M., & Hoff, A. M. (Litton Systems, Inc.). PLANIT support and utility programs--Flow charts. May 1976.

Flow charts are provided for the computer program logic of the computer PLANIT support and utility programs. The charts are designed for use in conjunction with the program listings. The programs were developed in support of the installation of the PLANIT (Programming Language for Interactive Teaching) author/student language on the AN/GYK-12 computer used in the U.S. Army Artillery Tactical Fire Direction System (TACFIRE).

RM 76-15. Holz, R. F., & Schreiber, E. M. (ARI); & Bauer, R. G. (Bendix Applied Sciences Division). Predicting drug use in the U.S. Army. July 1976.

Variables associated with use of different classes of drugs by enlisted men in the Army were examined. Data were collected between

October 1973 and January 1974 by a self-administered anonymous questionnaire returned by 1,106 enlisted men at installations in the continental United States, Alaska, and West Germany. Consideration was given to a range of possibly explanatory variables (social background, personality, and the military environment) and the possibility that the effect of each of these variables might be different for different classes of drugs. Correlates of reported illicit drug use were found to be strongly related to characteristics that individuals bring with them to the Army and do not appear to be strongly related to events the individual encounters after entry.

RM 76-16. Wheaton, G. R., Fingerman, P. W., Rose, A. M., & Leonard, R. L., Jr. (American Institutes for Research). Evaluation of the effectiveness of training devices: Elaboration and application of the predictive model. July 1976.

A preliminary structural model for forecasting the effectiveness of a training device was presented in Research Memorandum 76-6. This elaborates and applies an updated form of the earlier transfer of training model. Major concerns were determination of the kinds of data necessary to apply the model, assessment of the availability of the needed information, and development of a feasible and reliable set of procedures for predicting the effectiveness of a training device.

The updated model provides for generating predictions based on data concerning the potential of a device for training transfer, the learning deficits of the trainee population, and the extent to which the device incorporates training principles and techniques shown to have potential for enhancing training effectiveness. A predictive equation is derived using as parameters the outputs of an experimental application of the model. The formula describes experimentally obtained transfer effects in terms of savings in time, trials, or errors achieved by a pretraining group in relation to a control group with no pretraining.

RM 76-17. Scott, T. D. Photometric measurement of target-background contrast. September 1976.

In all surveillance systems, humans receive information about the tactical environment in either visual or auditory form. The Army has been concerned with identifying and quantifying major variables affecting visual target detection by observers. One variable that may play a central role in visual target acquisition processes is target-background brightness contrast. Although various contrast effects have been explored in laboratory settings, evaluation of the impact of brightness contrast on target acquisition in realistic tactical situations remains to be investigated. Before this can be done, however, a system must be developed that will yield valid and stable contrast measures in field contexts. The present paper notes and discusses factors that may be important in estimating target-background contrast.

RM 76-18. Wheaton, G. R., Rose, A. M., Fingerman, P. W., & Leonard, R. L., Jr. (American Institutes for Research); & Boycan, G. G. (ARI). Evaluation of three Burst-on-Target trainers. August 1976.

This report describes a formal model of transfer of training that can be used to predict the effectiveness of training devices. Research Memorandum 76-6 and Research Memorandum 76-16 describe earlier phases of the project. The immediate purpose of the experiment was to compare three Burst-on-Target (BOT) training devices as to effectiveness in preparing Advanced Individual Training personnel to apply BOT techniques with the laser device mounted in the M60A1 tank.

Three groups of 20 trainees each were trained on the devices until they achieved a prescribed proficiency level or until they had had 320 trials. A control group had 320 trials directly on the laser device. Following training, the three experimental groups were transferred to the laser device, where each trainee received 80 BOT trials.

In general, all three devices promoted positive transfer of training in terms of speed in applying BOT. However, after 50 trials, performance of the control group had improved to the point where it was indistinguishable from that of the experimental groups. Accuracy data revealed no significant differences among the four groups.

RM 76-19. Rose, A. M., Wheaton, G. R., Leonard, R. L., Jr., & Fingerman, P. W. (American Institutes for Research); & Boycan, G. G. (ARI). Evaluation of two tank gunnery trainers. August 1976.

This report is the fourth in a series on developing a model for predicting and evaluating the effectiveness of training devices. Field studies provided empirical data against which predictions from the projected model could be evaluated. This report compared the effectiveness of different amounts of training on two training devices for preparing Advanced Individual Training personnel to track and fire the main gun of a tank at a moving target as accurately and rapidly as possible. The basic issue was the ability of trainees, with practice at different levels of proficiency, to transfer their skills to the test situation. Transfer of training was evaluated in terms of accuracy, misses, and speed in responding to the command of fire.

R&D Utilization Reports

R&D UR 76-1. Maier, M. H., Young, D. L., & Hirshfield, S. F. Implementing the Skill Qualification Testing system. April 1976. (AD A023 994)

As part of a career-long process of training and testing enlisted personnel, Skill Qualification Tests (SQTs) have been developed for a large number of Military Occupational Specialties (MOS) and are replacing

MOS paper-and-pencil tests to assess soldier competence at successive skill levels. This report briefly describes the development of plans and procedures for constructing and validating SQT tests as well as steps in producing the required materials and manuals for installation of an SQT testing program.

Special Publications (P-Series)

P-75-1. Swezey, R. W., & Pearlstein, R. B. (Applied Science Associates, Inc.). Guidebook for developing criterion-referenced tests. August 1975. (AD A014 987)

The Army is changing its methods of testing enlisted performance in order to differentiate clearly those soldiers who demonstrate acceptable proficiency on a task from those who do not. The new criterion-referenced tests therefore differ from norm-referenced tests, which score an individual's proficiency in relation to that of all others taking the test. This manual gives test developers the rationale of the criterion-referenced approach and specific guidelines on how to construct test items and assemble the tests. Methods for assessing the adequacy of the tests are also provided.

P-75-2. Osborn, W. C., Ford, J. P., Moon, H. L., & Campbell, R. C. (Human Resources Research Organization); & Root, R. T., & Word, L. E. (ARI). Course outline: Instruction for unit trainers in how to conduct performance training. September 1975. (AD A017 722)

This course outline was prepared as part of Project UTRAIN, Research on Methods of Enhancing the Training Capability of Unit Training Personnel. It presents in detail the 10-hour UTRAIN course for teaching officers and NCOs how to manage and conduct performance-oriented training in their own units. The first 3 hours explain the principles and techniques of effective performance-oriented training; the remaining lessons are practical exercises. Included are detailed instructions for conducting the exercises, a student instructor guide, practice-instruction tasks, and scenarios for TRADOC videotapes.

ARI Research Report 1189 discusses Project UTRAIN--unit trainer needs, development of training to meet those needs, and implementation of the training in the Infantry Officer Basic Course at Fort Benning, Ga.

P-75-3. Kern, R. P., Sticht, T. G., Welty, D., & Hauke, R. N. (Human Resources Research Organization). Guidebook for the development of Army training literature. November 1975. (AD A033 935)

This guidebook is a complete job aid for the writer of Army performance-oriented training literature, such as Field Manuals,

Training Circulars, and special texts. Since this literature is designed to help Army personnel learn to perform job-related tasks, the guidebook emphasizes performance-oriented writing and content rather than topic-oriented writing. The guide also helps the writer maintain the appropriate reading level for the intended audience. Principles of training-literature preparation and good writing are demonstrated by extensive example in text and illustrations, to motivate the user with a minimum of lecturing on style.

P-76-1. An authoring aid for the PLATO IV CAI system. Lesson MONIFORM. February 1976.

This handbook is a programmed guide on how to use an authoring aid called Lesson MONIFORM (Monitoring Format) in writing questions for the PLATO IV computer-administered instruction system. MONIFORMS are used to create frequently used question types, such as multiple choice, constructed response, and matching. The writer provides the information relevant to the question--text, feedback messages for correct and incorrect responses, and instructions for analyzing the response--and uses MONIFORMS to enter the question properly into the computer instruction system.

P-76-2. Hirshfield, S. F., Young, D. L., & Maier, M. H. Procedures for validating Skill Qualification Tests. July 1976. (AD A036 997)

This publication presents detailed instructions and improved procedures for validating Skill Qualification Tests (SQTs).

Because SQTs test a soldier's actual performance of specific essential aspects of an MOS, they are constructed and validated in the field by Test Development Activities (TDA) within the Army Training and Doctrine Command (TRADOC). Included here are the sequences for reviewing item content for both the hands-on and written components of SQT Scorable Units, sample tryout items, and blank scoring forms.

P-77-1. Dyer, R. F., Matthews, J. J., Wright, C. E., & Yudowitch, K. L. (Operations Research Associates). Questionnaire Construction Manual. July 1976. (AD A037 815)

This manual is designed to help Army personnel who develop and administer questionnaires as part of Army field tests and evaluations, such as those conducted at the TRADOC Combined Arms Test Activity (TCATA) and the Combat Developments Experimentation Command (CDEC). The general content and concepts, however, are applicable to a variety of situations. As such, the manual should prove useful to all individuals involved in the construction and administration of surveys, interviews, and questionnaires.

Chapters 2 through 10 tell how to prepare items for questionnaires and how to assemble and arrange them into a complete questionnaire. Chapter 11 tells why it is important to pretest questionnaires and explains how to pretest. Chapter 12 discusses how characteristics of persons answering the questionnaire may influence results. Chapter 13 deals briefly with analysis and evaluation of answers, and Chapter 14 discusses interview questions.

P-77-2. Dyer, R. F., Matthews, J. J., Stulac, J. F., Wright, C. E., & Yudowitch, K. L. (Operations Research Associates). Questionnaire Construction Manual annex: Literature survey and bibliography. July 1976. (AD A043 012)

A literature survey on questionnaire construction encompasses journals, books, and reports in psychology, sociology, education, and marketing, and documentation published by the Defense Department. The search yielded over 2,000 references, which are listed in the 279-page annotated bibliography. A synthesis of the findings is based on abstracts selected for their relevance from the references. Results of the search were the basis for developing the Questionnaire Construction Manual designed for Army personnel responsible for field evaluations (P-77-1).

P-77-3. McNeil, J., Jr., Rosario, J., Jr., & Lyman, P. (Interactions, Inc.); & Thomas, J. A., & Hart, R. J. (ARI). Racial Harmony Training Program for unit leaders--Four-hour module on development of communication skills (a program of instruction). July 1975.

This module was part of an experimental Racial Harmony Training Program for leaders of Army units. The experimental program was a 24-hour workshop designed to improve company commanders' effectiveness in handling racial and ethnic problems. This module represents a 4-hour block of instruction. It is intended to give the company commander an exposure to basic skills in leading small discussion groups as well as information on race relations and equal opportunity problems.

Technical Reports

(A Series)

TR-75-A1. Powers, T. H., McCluskey, M. R., & Haggard, D. F. (Human Resources Research Organization); & Boycan, G. G., & Steinheiser, F., Jr. (ARI). Determination of the contribution of live firing to weapons proficiency. March 1975. (AD A036 060)

Cost and facility limitations place serious constraints on the use of live firing in weapons training and have led to research to determine optimum use of live firing in training. Dry firing (executing the

procedures for live firing without live ammunition) and miniature ranges using subcaliber weapons are training devices sometimes used. Other training devices are being developed. This research attempted to determine how important live firing is for achieving weapons proficiency and whether more extensive use of new training techniques and devices can produce required proficiency levels.

In preliminary research documented in Research Memos 76-8 and 76-20, two weapons systems, the M60A1 Tank and the 105mm Howitzer, were selected as the test weapons for an investigation of the contribution of live firing to weapons proficiency. In each of the two field tests, 56 crews were involved. The tank test dealt with the gunner's task of tracking and firing at both stationary and moving targets and compared results from four expeimental training methods using varying amounts of live firing and a training simulator. The artillery test involved six-man crews firing at stationary targets and compared results with varying amounts of live firing, a training simulator, and dry firing. After training, each crew was given a live-fire criterion test and paper-and-pencil tests.

In both field tests, the live-fire test showed no significant differences among the various training methods. The paper-and-pencil measures suggested that trainees preferred live firing training because it was more interesting.

TR-75-A2. Miller, E. E. (Human Resources Research Organization). Instructional strategies using low-cost simulation for electronic maintenance. July 1975. (AD A025 942)

The U.S. Army Air Defense School trains personnel to maintain complex electronic equipment. Because time to practice on real equipment is stringently limited, training alternatives that required a minimum amount of time on the actual equipment were particularly needed for newly developed complex systems. To determine whether low-cost simulation (photos and slides) could improve training in the maintenance of Air Defense systems, visual simulation materials and structured lesson plans were developed for five blocks of instruction on the Improved Hawk system. Trainees receiving the experimental training demonstrated significantly greater facility in checks, adjustments, and isolation of faults than did a control group. The strategies markedly improved training within practical school constraints with minimal increase in costs.

TR-75-A3. McCluskey, M. R., Trepagnier, J. C., Jr., Cleary, F. K., & Tripp, J. M. (Human Resources Research Organization). Development of performance objectives and evaluation of prototype performance tests for eight combat arms MOSs. Volume I: Development of performance objectives for eight combat arms MOSs. October 1975. (AD A033 546)

The project as a whole supported performance-based evaluation for the Army's Enlisted Personnel Management System. Phase I, reported in this report, was devoted to the development of performance objectives for critical or important tasks of eight combat arms MOS, Phase II (TR-75-A4) to a field investigation of four prototype performance tests.

Using task information previously obtained for the eight MOS, the criticality of the task statements with respect to MOS duties was determined by the combat arms schools. Each task was rated critical, important, nice-to-know, or irrelevant. For all tasks rated critical or important, performance objectives were developed. Each objective consisted of a task statement, the conditions of task performance, performance standards, and references. For Infantry, 397 objectives were developed; for Armor, 591; for Field Artillery, 316; and for Air Defense, 581.

TR-75-A4. McCluskey, M. R., Trepagnier, J. C., Jr., Cleary, F. K., & Tripp, J. M. (Human Resources Research Organization). Evaluation of prototype job performance tests for the U.S. Army infantryman. October 1975. (AD A033 545)

Following the development of performance objectives for eight key combat arms MOS (TR-75-A3), four prototype performance tests were evaluated in the field. Results showed considerable variability among test administrators in test site preparation--providing additional items of equipment or failure to follow site preparation instructions. Test administration procedures differed, ir variations in coaching and providing feedback to examinees, in verbatim reading of instructions to examinees, and in deviations from the test scenario. A low degree of interrater reliability was found for about one-third of the performance measures of each test. Perceived face validity of the tests was generally high with regard to job relevance and fairness. A substantial discrepancy was found, however, between test results and examinees' perceptions of whether or not they passed the test.

TR-75-A5. Harris, J. H., Campbell, R. C., Osborn, W. C., & Boldovici, J. A. (Human Resources Research Organization). Development of a model job performance test for a combat occupational specialty. Volume I. Test development. November 1975. (AD A025 102)

Job performance tests evaluate a soldier's current job proficiency by eliciting behaviors equivalent, or nearly equivalent, to those required in actual job performance. Performance tests may be expensive

in time and resources, but cover only part of what a person is expected to do on the job.

A solution to the problem may lie in a type of testing which evaluates not only the soldier's mastery of skills and knowledges but also ability to recognize and react to conditions that initiate task performance. In such functionally integrated testing, mastery of a task is evaluated in a job-related module that includes other tasks. The task in question is tested in context that maintains the logical relationship of the tasks, as distinguished from the conventional method of testing a task as a discrete incident.

This volume describes the development of a functionally integrated performance test: rational, methodology, revision, and reliability. Volume II (TR-75-A6) reports a field tryout of a functionally integrated performance test and provides guidelines for administering the test.

TR-75-A6. Harris, J. H., Campbell, R. C., Osborn, W. C., & Boldovici, J. A. (Human Resources Research Organization). Development of a model job performance test for a combat occupational specialty. Volume II. Instructions and procedures for conducting a functionally integrated performance test. November 1975. (AD A025 103)

The model job performance test for a combat Military Occupational Specialty was developed in response to the need for more effective and less expensive job performance measures, as described in Volume I. This volume reports the field tryout at Fort Bliss, Tex., and gives detailed guidelines for administering the performance test.

The test consisted of five modules related to each other but not dependent on each other for performance. The entire test required 12 hours to complete and had to be administered over terrain that supported the events--preoperations, route reconnaissance, specific reconnaissance, night operations, and postoperations. The first three modules were designed for daylight administration, the last two for night operation.

Field tryout indicated the concept of functionally integrated performance testing to be feasible. However, the test should be revised for other than experimental use. The test as described may be too costly for operational use but can provide a useful standard for examining the relevance of other measures of job proficiency.

TR-75-A7. Frederickson, E. W., Hermann, P. W., & Kubala, A. L. (Human Resources Research Organization). Assessment alternatives for a high skill MOS. December 1975.

This research investigated the feasibility of developing valid performance tests on actual equipment, suitable for complex technical Military Occupational Specialties (MOS). A highly skilled MOS,

electronics maintenance, was chosen. After analysis of the job tasks, performance tests were developed to categorize job activities and experimentally evaluated for selected activities. A mastery classification defined master and nonmaster categories on the basis of job experience, MOS test scores, and job performance rating. Empirical validity was found for two of the three tests using MOS score and for one test using job performance ratings.

Therefore, valid and reliable performance tests could be developed, but would require equipment, facilities, and standardization most feasible at an ideal location such as an electronics maintenance school.

TR-75-A8. Card, J. J., Goodstadt, B. E., Gross, D. E., & Shanner, W. M. (American Institutes for Research). Development of a ROTC/Army career commitment model, Volume I. November 1975. (AD A036 374)

This report provides a detailed account, summarized in TR-76-A1, of a 2-year project to develop a model of career commitment in young adults (primarily of college age). Volume II (TR-75-A9) provides the questionnaires used. The model was designed to provide the Army with information useful in recruiting, selecting, and retaining qualified officers through the ROTC program. The primary issues addressed were: Who joins ROTC? Why? Which members of ROTC intend to remain on as career Army officers? Why? What factors in the individual and in his or her home, school, and societal environment increase or decrease commitment to an Army career?

Data were collected from survey questionnaires completed by nationwide samples: 1,089 high school students, 1,633 ROTC and non-ROTC college students, and 634 ROTC-graduate Army officers in their period of obligated service. Path models of career commitment for subgroups of students and officers delineate the causal sequence leading from the predictor variables (eight for officers, nine for the students) to career commitment. The general model includes the following global factors: (a) U.S. and world political context, (b) school and study program context, (c) individual background and primary socialization conditions, (d) individual aptitudes, (e) individual life experiences or secondary socialization conditions, (f) individual values, interests, and aspirations, (g) individual attitudes, (h) information acquired by the individual about the career, and (i) career-related experiences.

TR-75-A9. Card, J. J., Goodstadt, B. E., Gross, D. E., & Shanner, W. M. (American Institutes for Research). Development of an ROTC/Army career commitment model, Volume II. Appendixes. November 1975. (AD A036 375)

These appendixes provide the questionnaires and ancillary materials used to survey high school and college students and officers who entered the Army through ROTC. The survey provided the data for the

model of ROTC career commitment described in detail in TR-75-A8 and summarized in TR-76-A1.

TR-76-A1. Card, J. J., & Shanner, W. M. (American Institutes for Research). Development of an ROTC/Army career commitment model: Management summary report. March 1976. (AD A033 701)

This publication summarizes findings of a 2-year research project to develop and test a model of ROTC/Army career commitment during college. The theoretical model was developed from a survey of the literature and interviews with 135 Army ROTC cadets and officers. Survey questionnaires gathered data to test the model from nationwide samples of high school students, college students--ROTC and non-ROTC--and ROTC-graduate Army officers. The model hypothesized that nine global factors were related to an individual's career commitment in general: (a) U.S. and world political and socioeconomic context, (b) school and study program context, (c) individual background and primary socialization factors, (d) individual aptitudes, (e) individual life experiences or secondary socialization conditions, (f) individual values, interests, and aspirations, (g) individual attitudes, (h) information acquired by the individual about the career, and (i) career-related experiences. Implications of the model for ROTC recruiting, selection, and retention are explained.

(B Series)

TR-74-B1. Fink, C. D., Behringer, R. D., Wagner, H., & Showel, M. (Human Resources Research Organization). A systems analysis of a self-paced, variable length course of instruction. June 1974.

Annex A: Training, administrative and disciplinary problems associated with U.S. Army clerk-typist (MOS 71B10/20) course.

Annex B: A comparison of graduates, dropouts, and instructors of the U.S. Army clerk-typist (MOS 71B10/20) course.

A systems analysis was made of a self-paced, variable-length course which trains enlisted personnel to type. Students were taught by programmed instruction and within limits could progress at their own rate. For the analysis, questionnaires were given students and instructors at two classes; training records were analyzed in relation to student academic and performance characteristics. Results suggested that successful and unsuccessful students are identifiable by the end of the first week, and that instructors should play a more formal, traditional role for effective teaching. Annexes present the findings in detail.

TR-75-B1. Bauer, R. G., Miller, T. J., & Dodd, M. I. (Bendix Corporation); & Segal, D. R. (ARI). Evaluation of early enlistment failures under the U.S. Army Trainee Discharge Program. November 1975.

The U.S. Army Trainee Discharge Program (TDP), begun in September 1973, was intended to eliminate trainees who showed themselves to be marginal or poor performers during their first 179 days of active duty service. This report describes (a) the sociological and psychological characteristics of TDP dischargees, (b) the reasons they are selected for early discharge, and (c) the manner in which the discharge process is performed. Results are based on surveys of representative samples of trainees and training cadre at two Army posts during May-July 1975.

The TDP dischargees, as compared with successful trainees, were more likely to have had less educational achievement, poor school relations, unemployment, fewer supervisory responsibilities, less job satisfaction, poor interpersonal relations in their work environment, and a low sense of personal competence. Their decision to enlist is more often prompted by their desire for a steady job, their desire to avoid or resolve financial problems, and advice from persons outside their immediate families. Moreover, when consulted, their parents were less likely to have favored their decision to enlist.

The TDP dischargees and nondischargees were essentially the same in terms of the type of home environment, marital status and quality of marital relations, levels of preenlistment drug use and juvenile delinquency, and sense of personal anxiety during Army training.

The Trainee Discharge Program appears to provide a generally efficient and equitable means for local commanders to rapidly screen out, at an early stage of their enlistment, soldiers who show themselves to be unsuitable for further military service.

TR-76-B1. Pask, G. (Systems Research, Ltd.). Current scientific approaches to decision making in complex systems. (Report of a conference held at Richmond, Surrey, England, 14-15 July 1975). April 1976.

In July 1975, a conference was held in England to elicit a fair picture of the state of the art of decisionmaking in Europe, the status of decision-oriented disciplines, and ongoing or contemplated lines of research. The 12 papers presented, on human decisionmaking, are printed in this report. These papers cannot be neatly classified, since one of the main points to emerge was that the classical departments of decisionmaking (for example, the distinction between a prescriptive or normative theory and a descriptive theory, which accounts for the human decision process) are not usually appropriate to the complex situations of primary interest. Some papers described work with man/machine simulations. While these are realistic to users, practical as models, and profitable as experimental tools, an outstanding issue is

the trade-off between "on line" training (what is learned in the simulation) and pretraining. Other papers dealt with the odd distortions (according to the "rational" standard) of human beings, the heuristics that people adopt, and the virtual impossibility of distinguishing decisionmaking, learning, and the formulation of problems.

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